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(71) Applicant: **BOOMERANG TRACKING INC.**  
[CA/CA]; 9280 Boul. de l'Acadie, Montréal, Québec  
H4N 3C5 (CA).

(72) Inventors: **BOULAY, André, Eric**; 121 Argile, Kirk-  
land, Québec H9H 3H9 (CA). **NELSON, Robert**; 207  
Eton Crescent, Hampstead, Québec H3X 3K9 (CA).

(74) Agent: **ROBIC**; 55 St-Jacques, Montreal, Quebec H2Y  
3X2 (CA).

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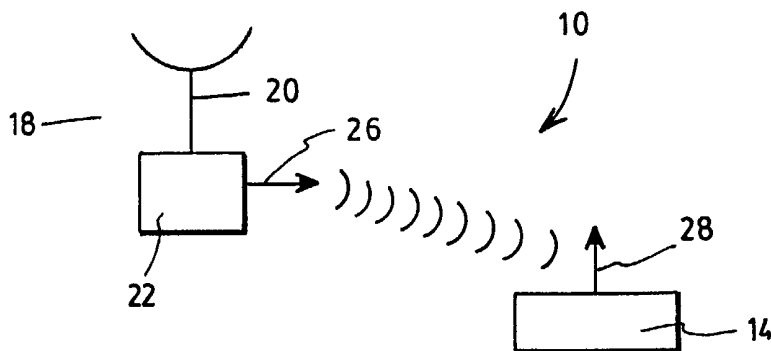
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For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: IMPROVED SYSTEM FOR LOCATING A STOLEN VEHICLE



(57) Abstract: An improved system for locating a stolen vehicle or the like is disclosed. The system includes a hidden transceiver (14) such as a cellular transceiver and a positioning device (18) such as a GPS antenna and chipset located apart from the transceiver. To avoid disclosure of the location of the transceiver by following wires, the positioning device and the transceiver are in wireless communication with each other.

WO 01/58730 A1

## **IMPROVED SYSTEM FOR LOCATING A STOLEN VEHICLE**

### **FIELD OF THE INVENTION**

5 The present invention relates to the field of locating stolen vehicles, and recovering the same, and more particularly concerns an improvement in a system for locating such a vehicle or the like.

### **BACKGROUND OF THE INVENTION**

10 With the ever increasing amount of vehicles equipped with wireless communication and positioning technologies, such as cellular phones and GPS antennas, there has been a growing interest in the field of anti-theft devices to use these technologies to locate stolen vehicles.

15 For example, U.S. patent no. 5,895,436 (SAVOIE et al) discloses a vehicle tracking system using an existing cellular network. In this system, the vehicle to be tracked is provided with a cellular transceiver hidden somewhere on the vehicle to prevent easy detection thereof, and operating on continuous standby mode. Upon activation of the system, the cellular transceiver is paged and one or more cells of the network located near the stolen vehicle are identified. A search vehicle is then informed of a search parameter defined by these cells.

20 U.S. patent no. 5,918,183 (JANKY et al.) concerns a concealed mobile communication system. Janky teaches mounting the antennas and transmitters/receivers of a GPS unit or cellular phone of both, so that a thief could not locate and therefore deactivate these systems, which may then be used to communicate information to the owner of the vehicle, a searching entity or the police. The various components of the locating equipment according to this patent  
25 however need to be connected together with wires, and these wires also need to be concealed if two components are apart from each other.

U.S. patents no. 5,418,537 (BIRD) and 5,918,180 (DIMINO) also disclose missing vehicle location systems or methods using cellular and GPS technologies.

## 5 SUMMARY OF THE INVENTION

It is an object of the present invention to provide a system for locating a stolen vehicle including positioning technology where hidden location equipment is not connected with wires and which may be followed to disclose its position.

10 Accordingly, in a system for locating a stolen vehicle including:  
a wireless transceiver for transmitting vehicle positioning information to a searching entity, the wireless transceiver being installed at a hidden location on said vehicle; and  
a positioning device for receiving the vehicle positioning information from  
15 satellite sources, the positioning device being installed on the vehicle at a location different from the hidden location of the wireless transceiver,  
the present invention provides the improvement wherein the system further includes wireless communication means for transmitting the vehicle positioning information from the positioning device to the wireless transceiver.

20 In accordance with another aspect of the invention, there is provided a system for locating a stolen vehicle including:  
a wireless transceiver for transmitting vehicle positioning information to a searching entity, the wireless transceiver being installed at a hidden location on said vehicle; and  
25 a positioning device for receiving the vehicle positioning information from satellite sources, the positioning device including a GPS antenna installed on the vehicle at a location different from the hidden location of the wireless transceiver, and a GPS chipset installed at the hidden location,  
the improvement wherein the system further includes wireless communication  
30 means for transmitting the vehicle positioning information from the GPS antenna to the GPS chipset.

Other features and advantages of the present invention will be better understood upon reading the following description of preferred embodiments thereof, with reference to the appended drawings.

5

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram illustrating the context of the present invention.

FIG. 2 is a diagram showing a system according to a first embodiment of  
10 the invention.

FIG. 3 is a diagram showing a system according to a second embodiment of the invention.

## 15 DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

Referring to FIGs. 1 and 2, the present invention concerns a system 10 for locating a stolen vehicle 12. Vehicle 12 is preferably a car but the present invention may easily be applied to any movable object susceptible to be stolen,  
20 such as buses, construction equipment, etc.

The system 10 first includes a wireless transceiver 14, preferably embodied by a cellular transceiver in communication with a network of stations 16. The transceiver 14 is adapted for transmitting information to a searching entity, during circumstances where the vehicle is to be located. For example, the present  
25 invention may be used in conjunction with a remote locating method using a tracking vehicle such as described in U.S. patent no. 5,895,436, *which is incorporated herein by reference*. The transceiver 14 is installed at a hidden location on the vehicle 12, in such a manner as to prevent a thief from easily spotting and consequently deactivating it.

30 The system 10 further includes a positioning device 18, preferably embodied by GPS antenna 20 and chipset 22. GPS antennas are well known in

the art and are readily available. The positioning device 18 receives through the antenna 20 vehicle positioning information from satellites 24. In the present embodiment, the positioning device 18 is installed on the vehicle 12 at a location different from the hidden location of the transceiver 14. Since GPS antennas  
5 presently need to be in a direct line of site with satellites 24, the positioning device 18 is therefore preferably installed at a location inside of the vehicle 12, but in view of the satellites 24.

For the system described above to work, there is a need for means to transmit the vehicle positioning information from the positioning device 18 to the  
10 transceiver 14. However, connecting the two with wires would compromise the secrecy of the transceiver's hidden location, since a thief could follow the wires from the positioning device all the way to the transceiver.

The present invention therefore provides the improvement wherein the system 10 further includes wireless communication means for transmitting the  
15 vehicle positioning information from the positioning device 18 to the wireless transceiver 14. These wireless communication means are preferably embodied by an omni-directional radio frequency antenna 26 connected to the GPS chipset 22, and a radio-receiver 28 connected to the transceiver 14. Also preferably, the radio frequency antenna 26 uses radio waves of a frequency of about 900 MHz.

Consequently, when the system is activated, indicating that the vehicle or  
20 object needs to be tracked, the signal is sent to the GPS antenna to activate itself and read or receive information from the appropriate satellites. This information is then relayed to the transceiver on board the vehicle or object, which transmits this information to the search entity. The entity may then transfer the information to a  
25 tracking vehicle, which uses it to track the vehicle or object.

Referring to FIG. 3, there is shown a second preferred embodiment of the present invention where the GPS chipset 22 is installed at the hidden location of transceiver 14. In this embodiment, the RF antenna is therefore directly connected  
30 to the GPS antenna 20, and the radio-receiver 28 is connected to the GPS chipset 22. Since they are at the same location, the GPS chipset 22 can be connected by wires 30 or directly on board to the transceiver 14 without any risks of disclosing

the hidden location to a thief. It will be readily understood by one skilled in the art that both embodiments are equivalent and that only the format of the vehicle positioning information at the moment of transmission by the radio antenna will be affected.

- 5           Of course, numerous modifications could be made to the embodiments described above without departing from the scope of the invention as defined in the appended claims.

**WHAT IS CLAIMED IS:**

1. In a system for locating a stolen vehicle comprising:

5 a wireless transceiver for transmitting vehicle positioning information to a searching entity, said wireless transceiver being installed at a hidden location on said vehicle; and

a positioning device for receiving the vehicle positioning information from satellite sources, said positioning device being installed on the vehicle at a location different from the hidden location of the wireless transceiver,

10 the improvement wherein the system further comprises wireless communication means for transmitting the vehicle positioning information from the positioning device to the wireless transceiver.

2. A system according to claim 1, wherein the wireless communication means  
15 comprise an omni-directional radio frequency antenna connected to the positioning device, and a radio-receiver connected to the wireless transceiver.

3. A system according to claim 2, wherein said radio frequency antenna uses radio waves of a frequency of about 900 MHz.

20

4. A system according to claim 1, wherein said positioning device includes a GPS antenna and a GPS chipset.

5. A system according to claim 1, wherein said wireless transceiver is a cellular  
25 transceiver.

6. In a system for locating a stolen vehicle comprising:

30 a wireless transceiver for transmitting vehicle positioning information to a searching entity, said wireless transceiver being installed at a hidden location on said vehicle; and

- a positioning device for receiving said vehicle positioning information from satellite sources, said positioning device including a GPS antenna installed on the vehicle at a location different from the hidden location of the wireless transceiver, and a GPS chipset installed at said hidden location,
- 5 the improvement wherein the system further comprises wireless communication means for transmitting the vehicle positioning information from the GPS antenna to the GPS chipset.
7. A system according to claim 6, wherein the wireless communication means
- 10 comprise an omni-directional radio frequency antenna connected to the GPS antenna, and a radio-receiver connected to the GPS chipset.
8. A system according to claim 7, wherein said radio frequency antenna uses radio waves of a frequency of about 900 MHz.
- 15 9. A system according to claim 6, wherein said wireless transceiver is a cellular transceiver.



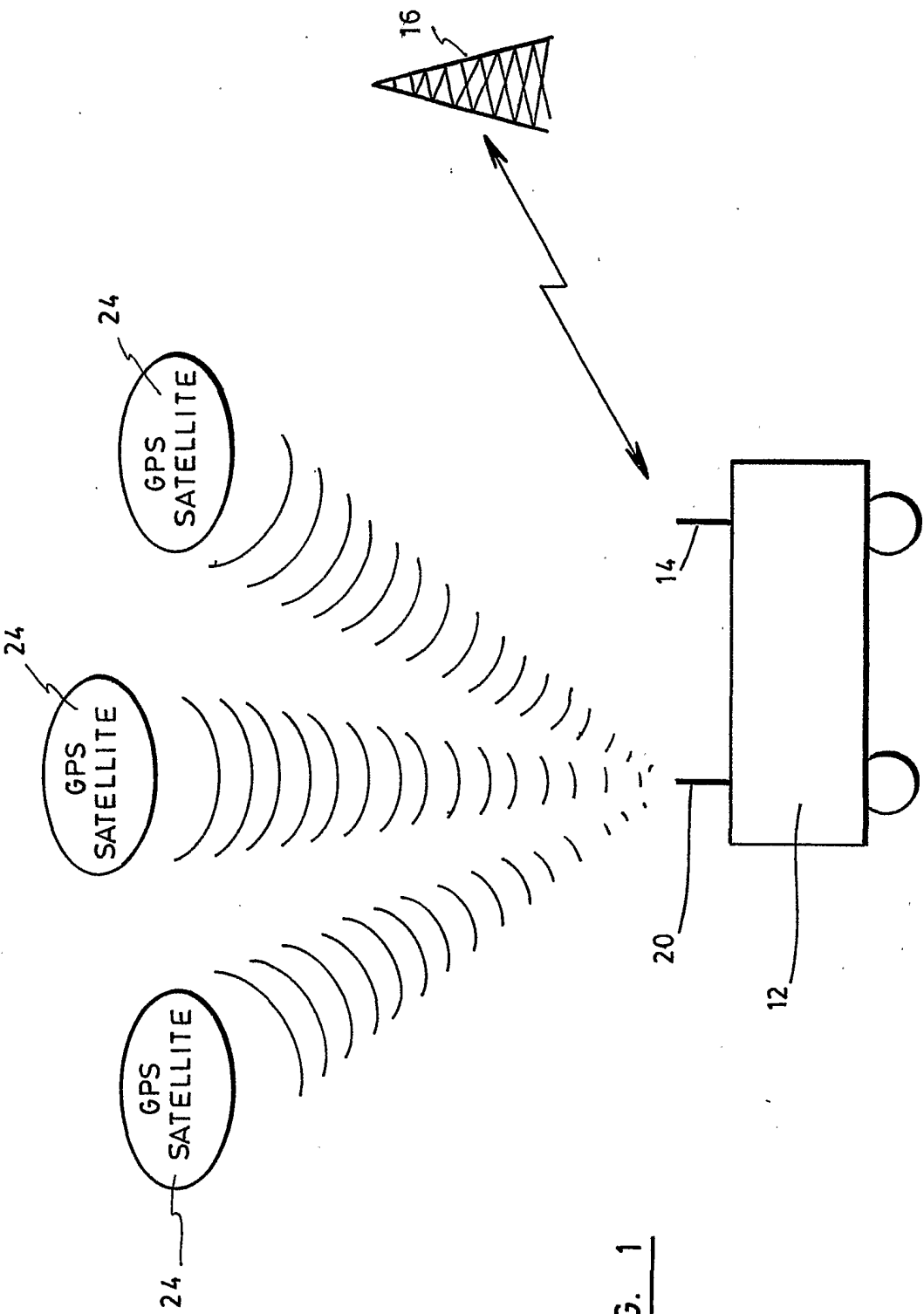
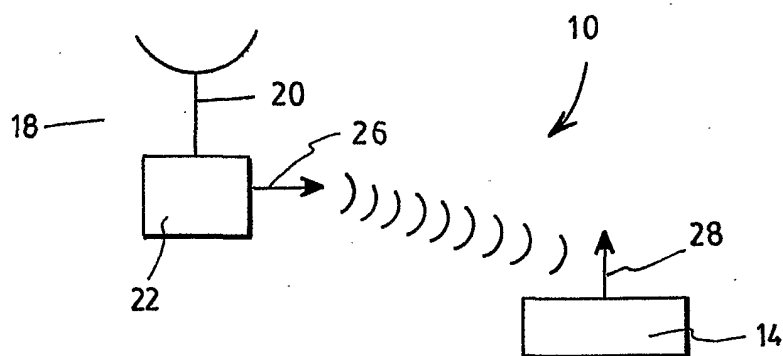
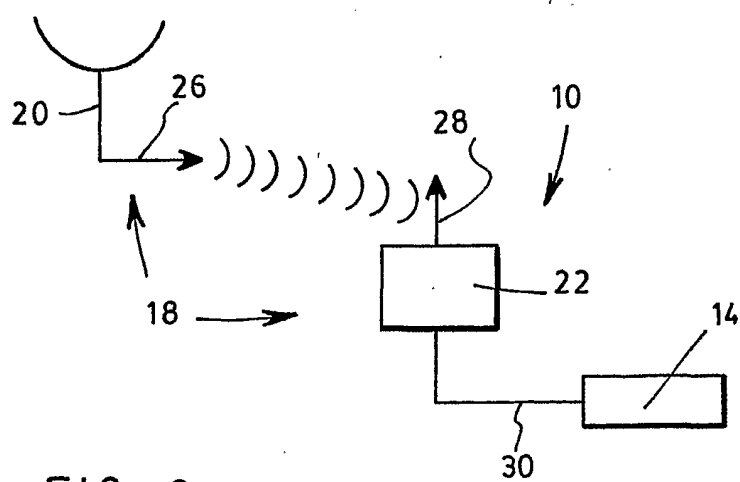


FIG. 1

FIG. 2FIG. 3

## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/CA 01/00138

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 B60R25/10

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 917 405 A (JOAO RAYMOND ANTHONY) 29 June 1999 (1999-06-29)	1-5
Y	column 5, line 5 - line 14 column 9, line 6 - line 21 column 15, line 35 - line 44 column 25, line 9 - line 22 column 26, line 18 - line 28 column 45, line 45 - line 60	6-9
Y	US 5 918 183 A (JANKY JAMES M ET AL) 29 June 1999 (1999-06-29) cited in the application column 8, line 48 - line 56; figure 23	6-9
A	US 5 473 200 A (WOO THOMAS) 5 December 1995 (1995-12-05) column 1, line 21 - line 40 column 3, line 26 - line 39	1,6
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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"P" document published prior to the international filing date but later than the priority date claimed

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Areal Calama, A-A

## INTERNATIONAL SEARCH REPORT

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 284 017 A (CHENG KAI LEUNG) 24 May 1995 (1995-05-24) page 1, line 1 - line 14 page 2, line 16 - line 27 -----	1,6

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International Application No  
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US 5473200	A	05-12-1995	AU 6892194 A	02-03-1995
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